

PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2013 Fisheries Management Survey Report

Marble Falls Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Marble Falls Reservoir were surveyed in 2013 using electrofishing and in 2014 using gill netting. Historical data are presented with the 2013-2014 data for comparison. This report summarizes results of the surveys and contains a fisheries management plan for the reservoir based on those findings.

- **Reservoir Description:** Marble Falls Reservoir is a 573-acre main-stem stable-level impoundment of the Colorado River, located in the City of Marble Falls, Burnet County, TX. It was constructed in 1951 by the Lower Colorado River Authority for purposes of hydroelectric power, recreation and water supply. The reservoir is riverine in nature with a limited number of coves and creeks. The reservoir area represents a geological transition between granite outcroppings and limestone formations of the Edwards Plateau, and its shoreline length is approximately 19 miles. The majority of the shoreline is private; however, three public boat ramps are available.
- **Management History:** Important sport fish include Largemouth Bass and catfish species. Florida Largemouth Bass was stocked in Marble Falls Reservoir in 1999 to increase Florida bass genetic influence. Channel Catfish were last stocked in 2012. Trap netting for White Crappie was not performed due to historically low catch rates and the high cost/benefit ratio associated with collecting these data. The lake is managed under statewide regulations.
- **Fish Community**
 - **Prey species:** Bluegill, Redbreast Sunfish, and Gizzard Shad were the predominant prey species available. Larger Redbreast Sunfish (≥ 6 inches) were present in good numbers, providing fishing opportunities for panfish anglers. Redear Sunfish and Longear Sunfish were also present.
 - **Catfishes:** Channel Catfish was the predominant catfish species. All Channel Catfish were of harvestable size and up to 18 inches in length. Flathead Catfish were present in low densities, but tended to be large. Blue Catfish were not observed.
 - **Black basses:** Largemouth Bass were abundant, but the population was dominated by sub-legal-length fish. Electrofishing catch rate improved since the last two surveys. On average, bass reached 14 inches by 2 years. Body condition of Largemouth Bass was adequate. Guadalupe Bass were also present at low densities.

Management Strategies: The reservoir's fish population should continue to be managed with existing harvest regulations. Conduct general monitoring surveys with gill nets and electrofishing equipment in 2017-2018. Standard access and vegetation surveys will be conducted in 2017/2018. Inform the public about the negative impacts of aquatic invasive species.

INTRODUCTION

This document is a summary of fisheries data collected from Marble Falls Reservoir from 2013–2014. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2013–2014 data for comparison.

Reservoir Description

Marble Falls Reservoir is a 573-acre stable-level impoundment of the Colorado River, located in the City of Marble Falls, Burnet County, TX. It was constructed in 1951 by the Lower Colorado River Authority (LCRA) for purposes of hydroelectric power, recreation and water supply. The reservoir forms part of the chain of “highland lakes” on the Colorado River, receiving water from Lyndon B. Johnson Reservoir and discharging in to Travis Reservoir. Marble Falls Reservoir is riverine in nature with a limited number of small coves and creeks. The upper third of the reservoir is extremely shallow (< 5 feet) and has many underwater hazards (granite boulders and outcroppings), making access to this part of the reservoir by motorized boats difficult. The reservoir area represents a geological transition between granite outcroppings and limestone formations of the Edwards Plateau. Habitat consisted of rock bluff, rocky shoreline, natural shoreline, bulkhead, and docks and piers. The reservoir maintains a stable water level, with little change in elevation, so a water level figure was omitted from this report (conservation level is 738 feet). Marble Falls Reservoir is eutrophic with a mean TSI chl-a of 51.26, and a 10-year change of +5.26 (Texas Commission on Environmental Quality 2011). Other descriptive characteristics for Marble Falls Reservoir are listed in Table 1.

Angler Access

Angler access at Marble Falls Reservoir was good for boat anglers, but poor for bank anglers. Boat access consisted of three public boat ramps. Public bank access was limited to park area at the Lakeside boat ramp. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Cummings and Magnelia 2010) included:

1. Continue standard sampling surveys to monitor the fishery.
Action: Standard electrofishing and gill netting surveys were conducted in 2013 and 2014 respectively.
2. Promote the sport fishery that is present when the opportunity arises.
Action: Although bank fishing access is limited, there has been potential interest from smallmouth buffalo anglers that have been made aware of the incidental catches of large smallmouth buffalo from the 2014 gill net survey. Channel Catfish opportunities were promoted in an outdoor magazine article.
3. Educate the public about invasive species through the use of media and the internet.
Action: Several posts on Facebook and articles in the district’s monthly column in the San Marcos Daily Record have addressed invasive species issues, especially with regard to zebra mussels. Signs have been posted at boat ramps to make the public aware of good practices to prevent the spread of zebra mussels.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
Action: Invasive species issues have been raised in several presentations to groups and also on an individual basis when constituents have been encountered.

Harvest regulation history: Sport fish in Marble Falls Reservoir are managed with statewide regulations (Table 3). The Guadalupe Bass 12-inch minimum length limit was changed to a statewide no minimum length limit in 2001. The White Bass minimum length limit was reduced to 10 inches in September 2004 as analyses indicated that population densities were probably determined by environmental factors rather than angler harvest.

Stocking history: Marble Falls Reservoir was last stocked with Channel Catfish in 2012 and Florida Largemouth Bass in 1999. The complete stocking history is in Table 4.

Vegetation/habitat management history: Marble Falls Reservoir has historically had very low aquatic vegetation coverage. Two native species of aquatic emergent vegetation (cattail and American waterwillow) accounted for only 5.5 acres (< 1% coverage) in 2005 (Cummings and Magnelia 2010). Most of the shoreline habitat was comprised of rock, bulkhead, and terrestrial grasses. No aquatic vegetation or habitat survey had been conducted until 2013, because no significant changes had occurred until then. Subsequent changes are addressed in the Results and Discussion section.

Water Transfer: Marble Falls Reservoir is primarily used for hydroelectric power, municipal water supply, and recreation. No inter-basin water transfers are known to exist at Marble Falls Reservoir.

METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-min stations) and gill netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill nets as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures Manual (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

Aquatic vegetation surveys were conducted during peak growing season around the entire reservoir. Aquatic vegetation coverage was estimated by the use of Trimble® GPS unit in conjunction with sonar depth finder. Species identification was confirmed on samples collected with a modified aquatic rake.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error ($RSE = 100 \times SE \text{ of the estimate/estimate}$) was calculated for all CPUE statistics. Ages were determined using otoliths for Largemouth Bass ($n = 13$) (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2012 and by electrophoresis for previous years.

RESULTS AND DISCUSSION

Habitat: In 2013, the littoral zone habitat consisted primarily of natural vegetated shoreline, rocks and bulkhead (Table 5).

Habitat for cover seeking species has been consistently below optimal for fish production (Durocher et al. 1984, Dibble et al. 1996). Total coverage estimate of all submerged aquatic plant species in 2013 was less than 10% (less than 80 acres). However, non-native species were recorded. At least 8% (48 acres) of the total was Eurasian watermilfoil (*Myriophyllum spicatum*), and hydrilla (*Hydrilla verticillata*) was documented at less than 1% (Table 6). The LCRA has implemented a plan to use herbicide treatments for the eradication/control of hydrilla and conduct vegetation surveys to monitor effectiveness. American waterwillow (*Justicia americana*) coverage was still less than 1% of the total reservoir area, but actual acreage increased from 5 acres in 2005 to 21 acres in 2013.

Prey species: Gizzard Shad, Bluegill, and Redbreast Sunfish were the predominant prey species in 2013. Redear Sunfish and Longear Sunfish were the most abundant of the remaining forage species available (Appendix A). Threadfin Shad were not captured during the 2013 and 2005 surveys, but they were present in 2009 (360.0/h). However, a continued presence has been documented during a Texas Department of Transportation (TXDOT) demolition project of the US 281 bridge over Marble Falls Reservoir in 2013 (Appendix E). The IOV for Gizzard Shad was zero, indicating that no Gizzard Shad of vulnerable size (≤ 8 inches) were available to existing predators. The IOV estimates were low in 2009 (IOV = 17) and 2005 (IOV = 15). Total CPUE of Gizzard Shad in 2013 (19.0/h) was lower than in the 2009 (30.0/h) and 2005 (39.0/h) surveys (Figure 1). Total CPUE of Redbreast Sunfish in 2013 (160.0/h) was similar to the total CPUE from the 2009 survey (170.0/h), but much higher than in the 2005 survey (73.0/h); a greater number of larger individuals (≥ 7 inches) were sampled, providing good fishing opportunities for panfish anglers (Figure 2). A new water body record (rod and reel) for Redbreast Sunfish was established in 2012 (0.5 pounds, 8.0 inches). Total CPUE of Bluegill in 2013 (176.0/h) was higher than that obtained in 2009 (118.0/h), but similar to that recorded in 2005 (179.0/h) (Figure 3). Bluegill in the 6- to 8-inch size range were more abundant than in previous years.

Catfishes: The gill net catch rate of Channel Catfish in 2014 (3.0/nn) was comparable to that recorded in 2010 (3.6/nn) and higher than that obtained in 2006 (1.8/nn) (Figure 4). All fish were of harvestable size (≥ 12 inches) and up to 18 inches in length. Body condition was good for most size classes of fish ($W_r \geq 100$). Flathead Catfish were present in low numbers. The gill net catch rate of Flathead Catfish was 0.4/nn in 2014, which was slightly higher than in 2010 (0.2/nn). The biggest fish was 30 inches in length (Figure 5). Blue Catfish were not captured in the 2014 survey and none were sampled in 2006 (De Jesus and Magnelia 2006). However, Blue Catfish were recorded in 2010 with a CPUE of 1.0/nn (Cummings and Magnelia 2010) and a new water body record (via jug line) was established in 2013 (36.7 pounds, 40.5 inches).

Largemouth Bass: Total CPUE in 2013 (155.0/h) had increased since 2009 (85.0/h) and 2005 (100.0/h) (Figure 6). The increase in the relative abundance of young-of-the-year bass may be due in part to the increase in habitat provided by the expansion of submerged aquatic vegetation. The electrofishing catch rate of stock-length Largemouth Bass was 67.0/h in 2013 which is higher than in 2009 (50.0/h) and 2005 (49.0/h). While the population was dominated by sub-legal-length fish, individuals exceeding the legal length limit were available for anglers. Catch rates of harvestable bass (CPUE-14) were 12.0/h in 2013, 9.0/h in 2009, and 10.0/h in 2005. Population size structure indices were similar for the last three surveys (Figure 6). In 2013, PSD (43) and PSD-P (10) were at the low end of the expected range (PSD: 40 to 70, PSD-P: 10 to 40) for a balanced population (Gabelhouse 1984). Age and growth analysis from 2013 indicated individuals on average reached 14 inches by 2 years ($N = 13$; range = 1 – 4 years), which is normal for central Texas reservoirs (Figure 7). Body condition of Largemouth Bass in 2013 was good for most size classes of fish (average relative weights from 89 to 106) (Figure 6). All largemouth Bass sampled in 2013 ($n = 30$) were intergrades and the Florida Largemouth Bass influence was 59.0% (Table 7).

Fisheries management plan for Marble Falls Reservoir, Texas

Prepared – July 2014.

ISSUE 1: Marble Falls Reservoir has poor reservoir morphology (low SDI) and low water residence time resulting in limited productivity (Baker et al. 1993). Quality aquatic habitat is also limited. Under these circumstances many sport fish species in Marble Falls Reservoir don't thrive. Additional fisheries management through supplemental stocking or, more restrictive length limit harvest regulations would likely be ineffective or minimally effective. The structural composition of its shoreline (Appendix D) and riverine nature makes it difficult to implement sustainable habitat enhancement projects.

MANAGEMENT STRATEGY

1. Continue standard sampling surveys to monitor the fishery.
2. Promote the sport fishery that is present when the opportunity arises.

ISSUE 2: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2017/2018 (Table 8). Gill net surveys are only necessary every four years at this point to document presence or absence of Channel Catfish, Flathead Catfish and White Bass. Trap net sampling for White Crappie has been eliminated on this reservoir because of low historical trap net catches and low directed angler effort for this species.

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Table 1. Characteristics of Marble Falls Reservoir, Texas.

Characteristic	Description
Year constructed	1951
Controlling authority	Lower Colorado River Authority
Counties	Burnet and Llano
Reservoir type	Mainstream: Colorado River
Shoreline Development Index (SDI)	3.1
Conductivity	370 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Marble Falls Reservoir, Texas, August, 2013. Reservoir elevation at time of survey was 736 feet above mean sea level. This is a stable-level reservoir (conservation level is 738 feet).

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft.)	Condition
Lakeside Park	30.567403 -98.278761	Y	8	NA	Good
Johnson Park	30.567508 -98.281231	Y	6	NA	Good
Out Ramp	30.562392 -98.283278	Y	4	NA	Good

Table 3. Harvest regulations for Marble Falls Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5 ^a	14-inch minimum
Bass, Guadalupe	5 ^a	None
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Daily bag for Largemouth Bass and Guadalupe Bass = 5 fish in any combination.

Table 4. Stocking history of Marble Falls Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue Catfish	1971	38,200	UNK	UNK
	1979	<u>21,868</u>	UNK	UNK
	Total	60,068		
Channel Catfish	1966	20,700	AFGL	7.9
	1969	18,500	AFGL	7.9
	1971	10,500	AFGL	7.9
	1972	15,000	AFGL	7.9
	1984	7,523	AFGL	11.0
	2012	<u>211,835</u>	FRY	0.7
	Total	284,058		
Florida Largemouth Bass	1999	<u>78,525</u>	FGL	1.4
	Total	78,525		
Green Sunfish x Redear Sunfish	1966	<u>200</u>		UNK
	Total	200		
Largemouth Bass	1966	<u>1,200</u>	UNK	UNK
	Total	1,200		
Palmetto Bass (Striped Bass X White Bass hybrid)	1976	1,922	UNK	UNK
	1980	9,100	UNK	UNK
	1983	<u>7,873</u>	UNK	UNK
	Total	18,895		
Smallmouth Bass	1978	48,000	UNK	UNK
	1979	36,350	UNK	UNK
	1980	10,000	UNK	UNK
	1988	<u>38,954</u>	FRY	0.5
	Total	133,304		
White Crappie	1971	<u>1,000</u>	UNK	UNK
	Total	1,000		

Table 5. Survey of structural habitat types, Marble Falls Reservoir, Texas, 2013. Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Bulkhead	1.38 miles	7.0
Bulkhead with piers & boat docks	1.57 miles	8.0
Natural shoreline	8.80 miles	46.0
Natural shoreline with piers and boat docks	0.08 mile	0.0
Rocky shoreline	3.49 mile	18.0
Rock shoreline with piers and boat docks	0.39 mile	2.0
Rock bluff	2.23 miles	12.0
Rocky bluff with piers and boat docks	1.23 mile	6.0

Table 6. Survey of aquatic vegetation, Marble Falls Reservoir, Texas, 2005 and 2013. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2005	2013
Native emergent		
Bulrush		(Not mapped)
Cattail	<1 (<1)	(Not mapped)
American waterwillow	5 (<1)	21 (<1)
Non-native		
Eurasian watermilfoil		48 (8)
Watermilfoil/chara/coontail/ bushy pondweed mix		8 (1)
Watermilfoil/chara mix		<1 (<1)
Watermilfoil/hydrilla mix		<1 (<1)

Gizzard Shad

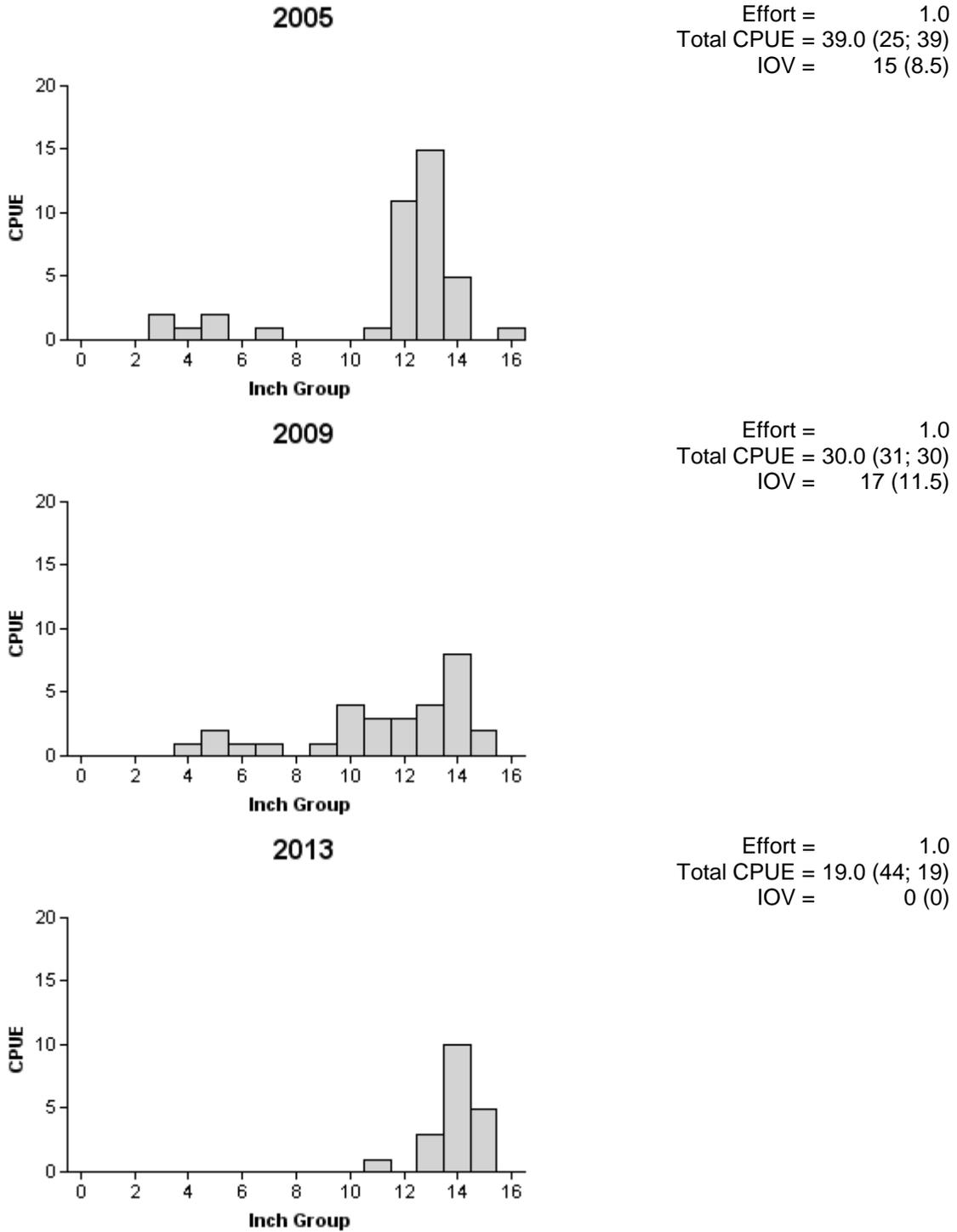


Figure 1. Number of Gizzard Shad caught per hour (CPUE) population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Marble Falls Reservoir, Texas, 2005, 2009 and 2013.

Redbreast Sunfish

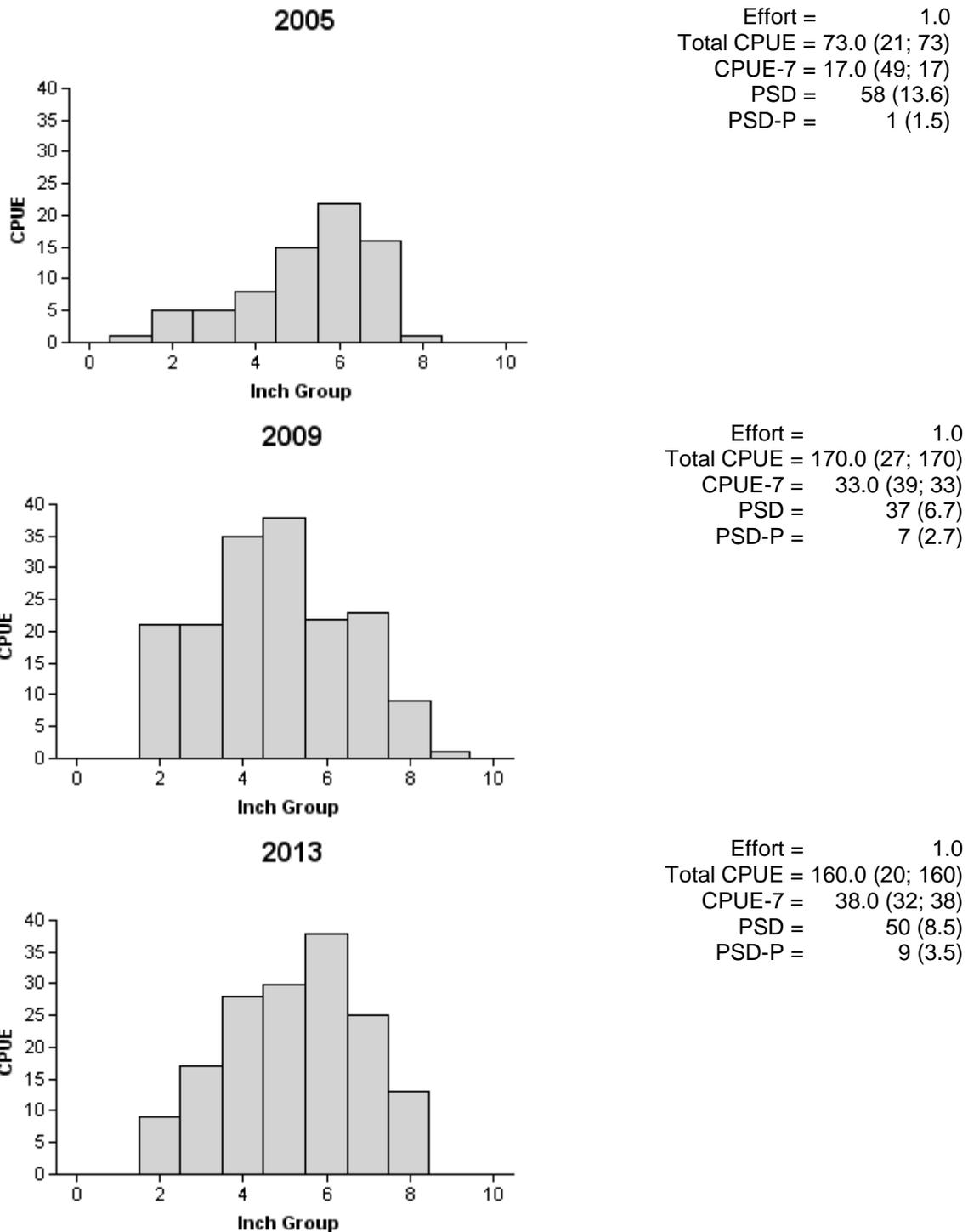
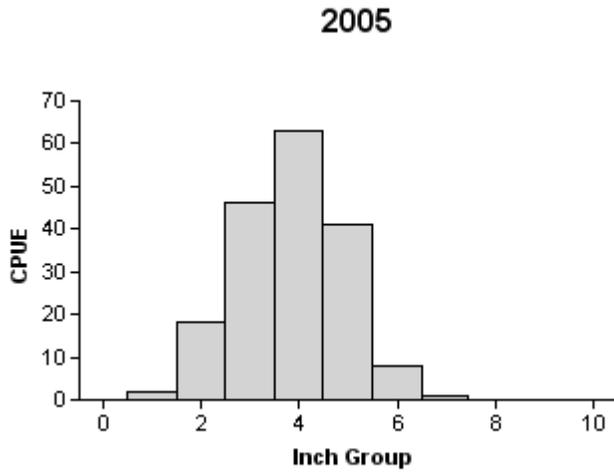
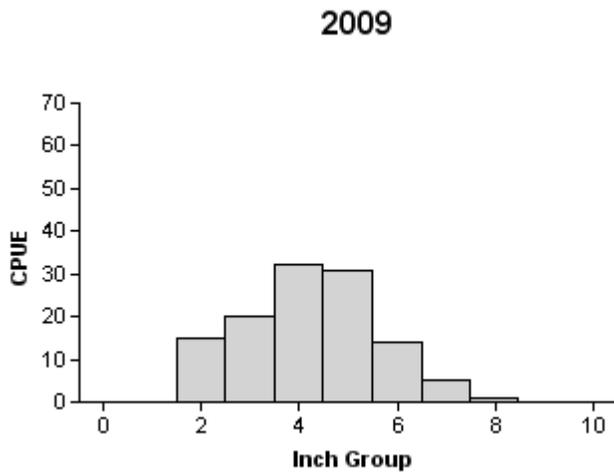


Figure 2. Number of Redbreast Sunfish caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Marble Falls Reservoir, Texas, 2005, 2009 and 2013.

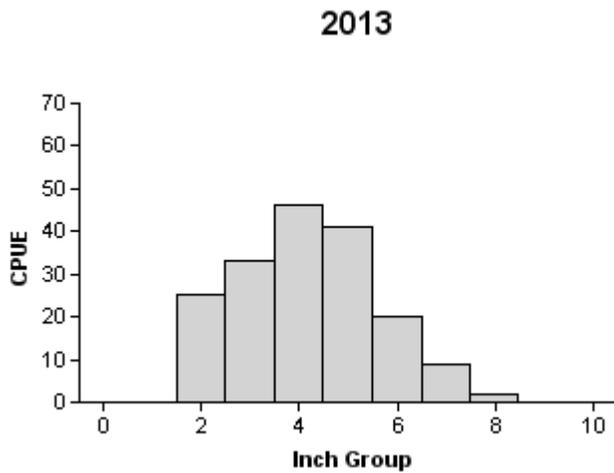
Bluegill



Effort = 1.0
 Total CPUE = 179.0 (24; 179)
 CPUE-7 = 1.0 (100; 1)
 PSD = 6 (3.4)



Effort = 1.0
 Total CPUE = 118.0 (20; 118)
 CPUE-7 = 6.0 (39; 6)
 PSD = 19 (5.4)



Effort = 1.0
 Total CPUE = 176.0 (21; 176)
 CPUE-7 = 11.0 (49; 11)
 PSD = 21 (6.5)

Figure 3. Number of Bluegill caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Marble Falls Reservoir, Texas, 2005, 2009 and 2013.

Channel Catfish

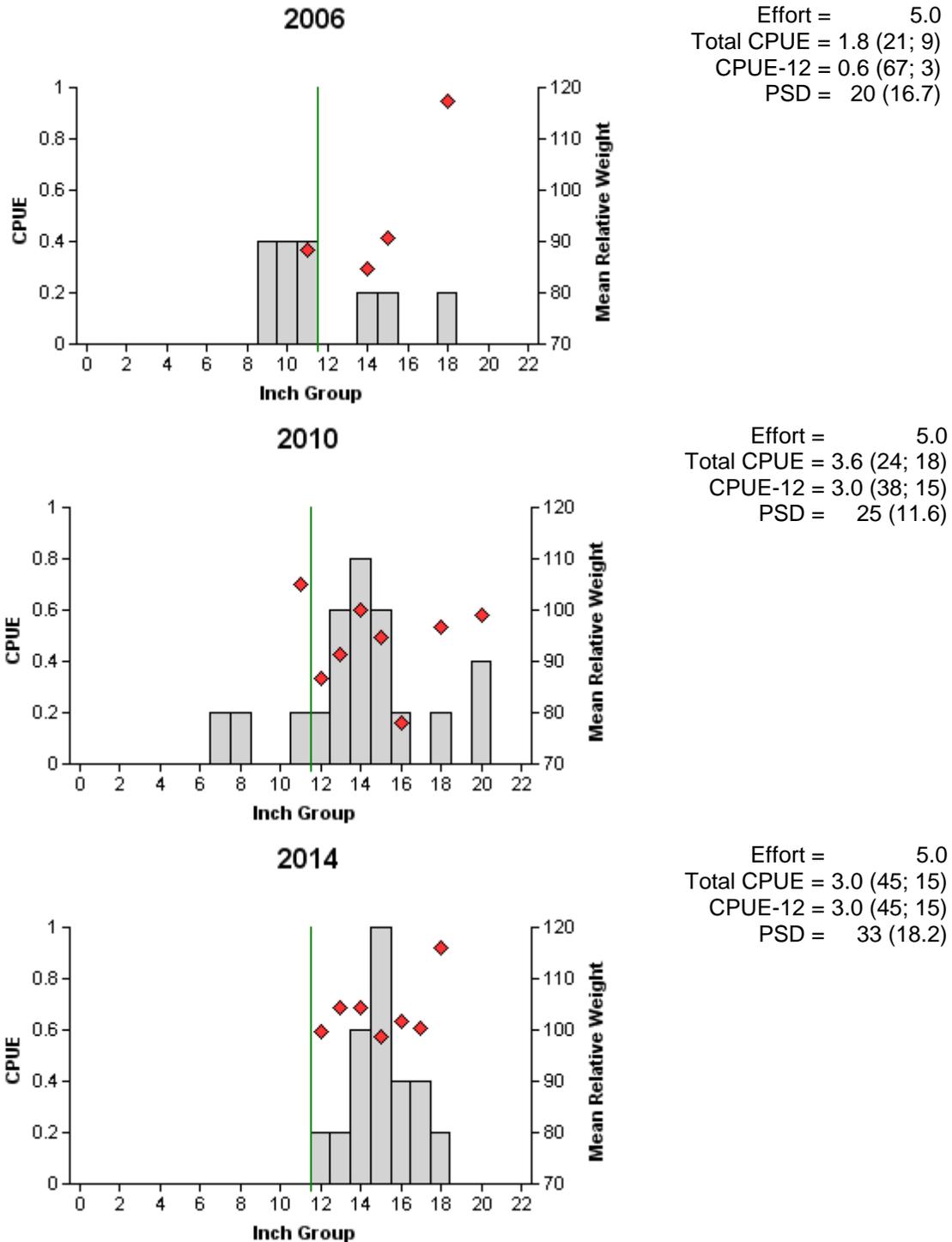


Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Marble Falls Reservoir, Texas, 2006, 2010 and 2014. Vertical line represents minimum length limit at the time of sampling.

Flathead Catfish

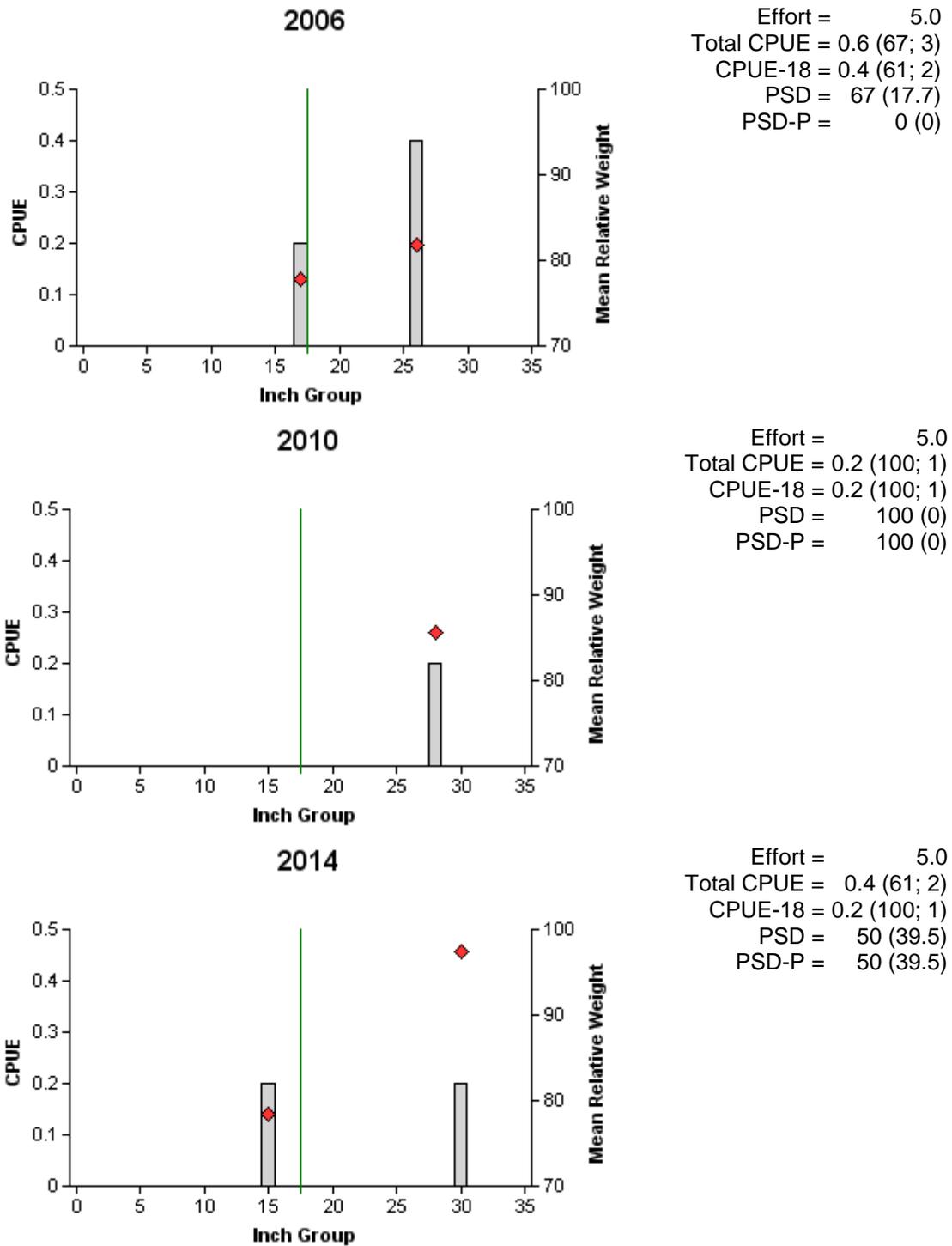


Figure 5. Number of Flathead Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Marble Falls Reservoir, Texas, 2006, 2010 and 2014. Vertical line represents minimum length limit at the time of sampling.

Largemouth Bass

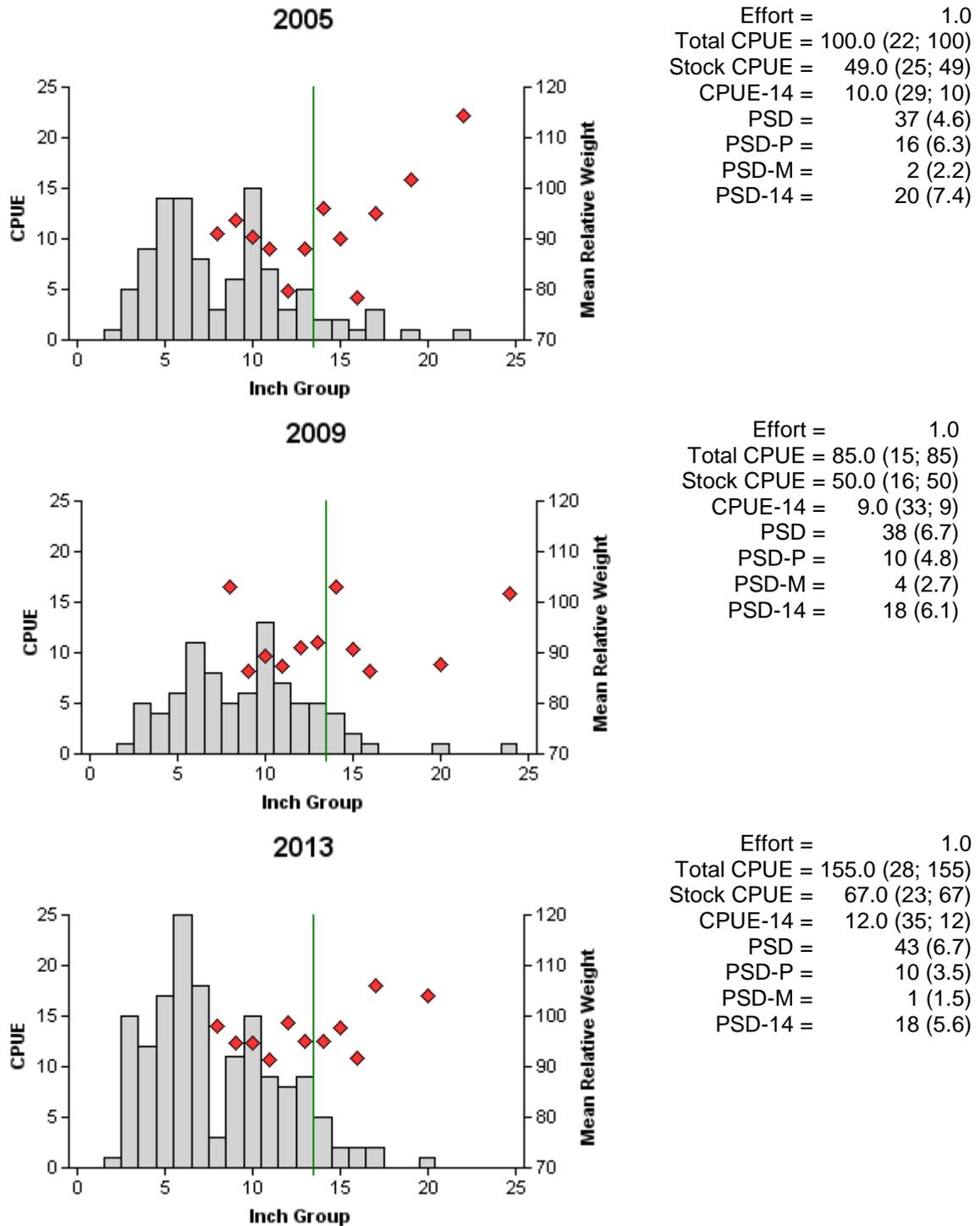


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Marble Falls Reservoir, Texas, 2005, 2009 and 2013. Vertical lines represent minimum length limit at the time of sampling.

Largemouth Bass

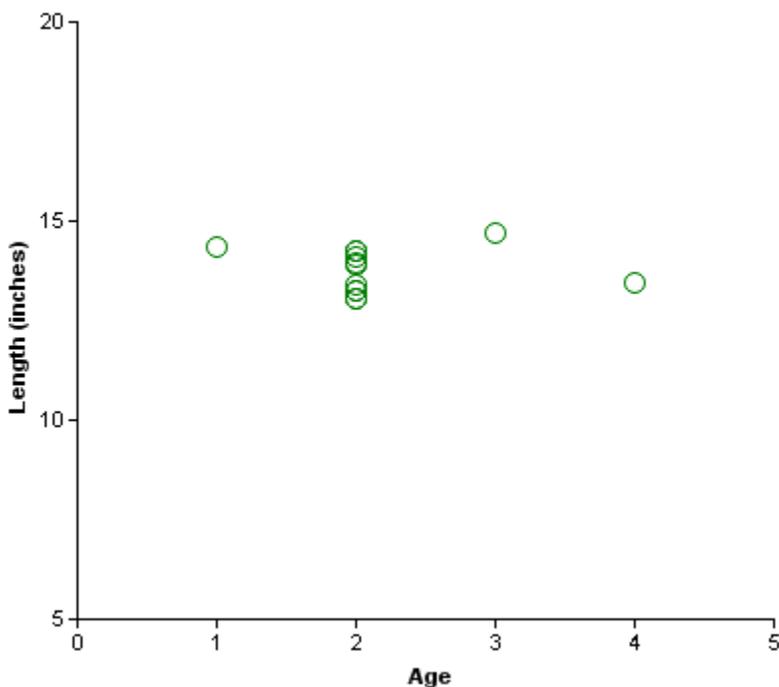


Figure 7. Length at age for Largemouth Bass collected by electrofishing at Marble Falls Reservoir, Texas, November 2013.

Table 7. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Marble Falls Reservoir, Texas, 2001, 2005, and 2013. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005. No genetic analysis was conducted in 2009.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2001	30	4	22	4	44.2	13.3
2005	30	0	30	0	50.7	0.0
2013	30	0	30	0	59.0	0.0

Table 8. Proposed sampling schedule for Marble Falls Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall (except where noted). Standard survey denoted by S and additional survey denoted by A.

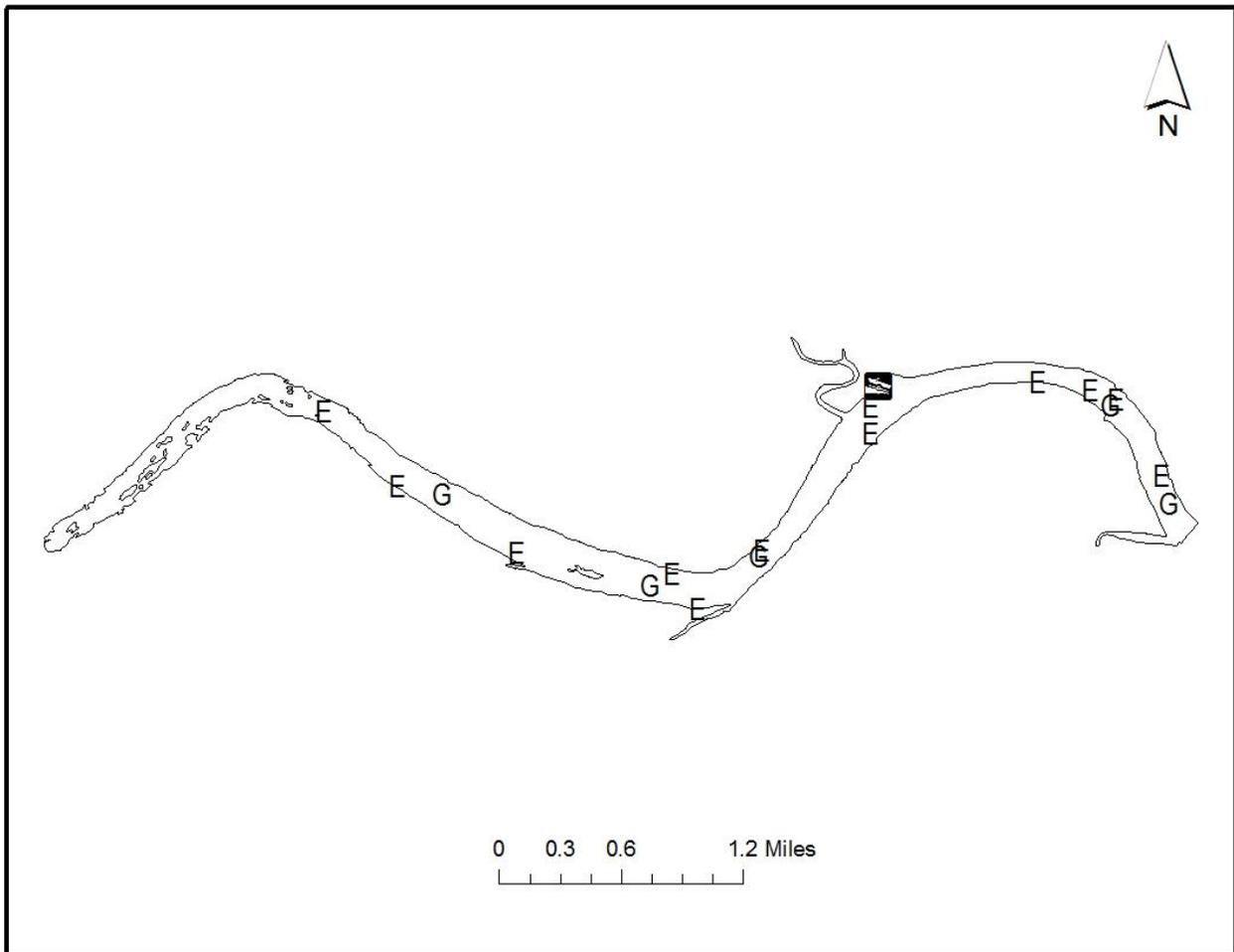
Survey year	Electrofishing Fall(Spring)	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2014-2015								
2015-2016								
2016-2017								
2017-2018	S		S	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Marble Falls Reservoir, Texas, 2013-2014. Sampling effort was 5 net nights for gill netting and 1 hour for electrofishing.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			19	19.0
Channel Catfish	15	3.0		
Flathead Catfish	2	0.4		
White Bass	3	0.6		
Redbreast Sunfish			160	160.0
Green Sunfish			6	6.0
Warmouth			11	11.0
Bluegill			176	176.0
Longear Sunfish			23	23.0
Redear Sunfish			40	40.0
Largemouth Bass			155	155.0
Guadalupe Bass			6	6.0
Logperch			1	1.0
Rio Grande Cichlid			16	16.0

APPENDIX B

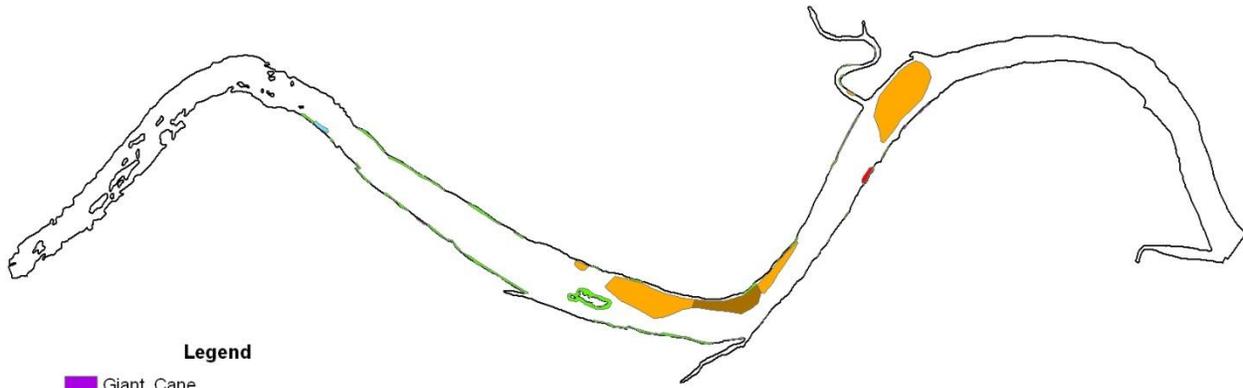


Location of sampling sites, Marble Falls Reservoir, Texas, 2013-2014. Gill net and electrofishing stations are indicated by G and E respectively. The main boat ramp is indicated by the boat ramp symbol (▣). Water level was near full pool at the time of sampling.

APPENDIX C

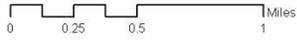
Aquatic vegetation survey coverage map for Marble Falls Reservoir, Texas, August 2013.

Marble Falls Vegetation Survey 2013



Legend

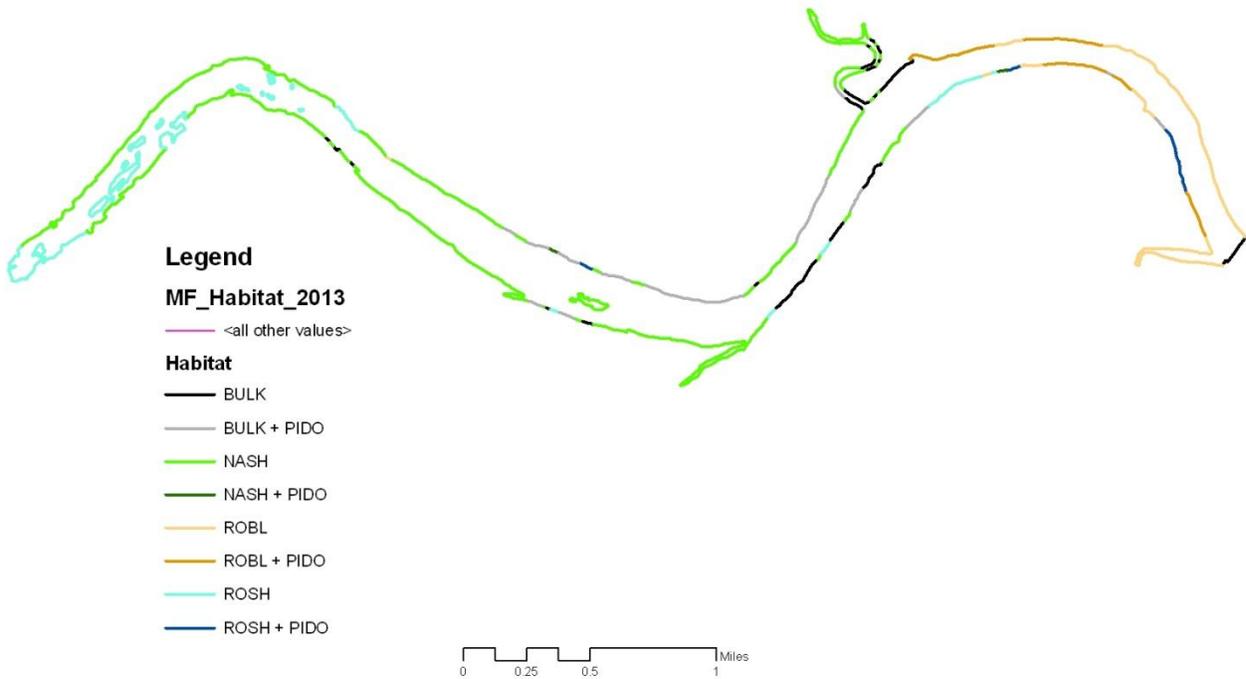
- Giant_Cane
- Milfoil_Hydrilla_Mix
- Elephant_Ear
- Milfoil_Chara_Mix
- Milfoil_Chara_Coontail_Naiad_Mix
- Milfoil
- Water_Willow



APPENDIX D

Shoreline habitat survey map for Marble Falls Reservoir, Texas, August 2013.

Marble Falls Habitat Survey 2013



APPENDIX E

Fish relocation and mortality data from TXDOT US 281 bridge demolition project, Marble Falls Reservoir, TX, 2013.

Lake Marble Falls, Hwy 281 Bridge Demolition			March 17, 2013		April 5, 2013	
Family	Common Name	Scientific Name	Relocated N	Mortality N	Relocated N	Mortality N
Lepisosteidae	longnose gar	<i>Lepisosteus osseus</i>	1			
Clupeidae	gizzard shad	<i>Dorosoma cepedianum</i>	70		2	61
	threadfin shad	<i>Dorosoma petenense</i>	5			2
Cyprinidae	blacktail shiner	<i>Cyprinella venusta</i>	2			1
	bullhead minnow	<i>Pimephales vigilax</i>				4
Catastomidae	smallmouth buffalo	<i>Ictiobus bubalus</i>				10
Ictaluridae	yellow bullhead	<i>Ameiurus natalis</i>	2			1
	blue catfish	<i>Ictalurus furcatus</i>				1
	channel catfish	<i>Ictalurus punctatus</i>				41
	flathead catfish	<i>Pylodictis olivaris</i>				1
Atherinopsidae	inland silverside	<i>Menidia beryllina</i>	2			
Fundulidae	blackstripe topminnow	<i>Fundulus notatus</i>	1			
Moronidae	white bass	<i>Morone chrysops</i>	2			1
Centrarchidae	redbreast sunfish	<i>Lepomis auritus</i>	101			31
	green sunfish	<i>Lepomis cyanellus</i>	30			5
	warmouth	<i>Lepomis gulosus</i>	18			23
	bluegill	<i>Lepomis macrochirus</i>	46			513
	longear sunfish	<i>Lepomis megalotis</i>	21			61
	redecor sunfish	<i>Lepomis microlophus</i>				20
	Guadalupe bass	<i>Micropterus treculii</i>	1			
	largemouth bass	<i>Micropterus salmoides</i>	20			11
	white crappie	<i>Pomoxis annularis</i>				1
Percidae	bigscale logperch	<i>Percina macrolepida</i>				1
Sciaenidae	freshwater drum	<i>Aplodinotus grunniens</i>	1			6
Cichlidae	Rio Grande cichlid	<i>Cichlasoma cyanoguttatum</i>	9			3
N of species			17	0	1	21
N of individuals			332	0	2	798